

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A short-circuiting member ~~being~~ characterized by comprising:
 - a plurality of components, each having an outer circumference and an inner circumference, and each of the plurality of components including:
 - a plurality of outer circumference terminals arranged along the outer circumference;
 - a plurality of inner circumference terminals arranged along the inner circumference; and
 - a plurality of connection portions, each connecting a corresponding one of the outer circumference terminals and a corresponding one of the inner circumference terminals with the connection portions separated from each other by a predetermined angle in a circumferential direction, wherein:
 - the plurality of outer circumference terminals, the plurality of inner circumference terminals, and the plurality of connection portions are substantially formed along the same plane;
 - the plurality of components are laminated in a state in which the connection portions of one of the plurality of components are reversed to the connection portions of another one of the plurality of components; and
 - the outer circumference terminals that are

adjacent in a lamination direction are in contact with each other, the inner circumference terminals that are adjacent in the lamination direction are in contact with each other, and the connection portions that are adjacent in the lamination direction are not in contact with each other.

2. (Currently Amended) The short-circuiting member according to claim 1, ~~characterized in that~~ wherein the adjacent connection portions are bent or curved so as to be spaced from each other.
3. (Currently Amended) The short-circuiting member according to claim 1, ~~characterized in that~~ wherein each of the plurality of connection portions is thinner than the outer circumference terminals and the inner circumference terminals, the short-circuiting member further including:
an insulator arranged between the adjacent connection portions.
4. (Currently Amended) The short-circuiting member according to claim 3, ~~being characterized by~~ further comprising:
an interval maintaining member for maintaining an interval between the adjacent connection portions.
5. (Currently Amended) The short-circuiting member according to claim 4, ~~characterized in that~~ wherein:
the insulator includes a positioning portion for positioning the plurality of components in the circumferential direction.
6. (Currently Amended) The short-circuiting member according

to ~~any one of claim[[s]] 1 to 5, characterized in that~~
wherein:

each of the plurality of connection portions is formed
along an involute curve.

7. (Currently Amended) The short-circuiting member according
to ~~any one of claim[[s]] 1 to 6, characterized in that~~
wherein:

at least either one of the plurality of outer
circumference terminals and the plurality of inner
circumference terminals include fitting recesses and
fitting projections that are formed alternately in the
circumferential direction.

8. (Currently Amended) The short-circuiting member according
to claim 7, ~~characterized in that~~ wherein:

the fitting recesses and the fitting projections are
formed in a substantially middle part of the plurality of
outer circumference terminals or the plurality of inner
circumference terminals.

9. (Currently Amended) A commutator ~~being characterized by~~
comprising:

the short-circuiting member according to ~~any one of~~
claim[[s]] 1 ~~to 8~~; and

a plurality of segments connected to the plurality of
outer circumference terminals or the plurality of inner
circumference terminals.

10. (Currently Amended) A commutator ~~including~~ comprising: a commutator main body having a plurality of segments arranged along a circumference, ~~the commutator being characterized by:~~

a short-circuiting member including a plurality of components, each having an outer circumference and an inner circumference, and each of the plurality of components including:

a plurality of outer circumference terminals arranged along the outer circumference;

a plurality of inner circumference terminals arranged along the inner circumference; and

a plurality of connection portions, each connecting a corresponding one of the outer circumference terminals and a corresponding one of the inner circumference terminals with the connection portions separated from each other by a predetermined angle in a circumferential direction, wherein:

the plurality of outer circumference terminals, the plurality of inner circumference terminals, and the plurality of connection portions are substantially formed along the same plane;

the plurality of components are laminated in a state in which the connection portions of one of the plurality of components are reversed to the connection portions of another one of the plurality of components; and

the outer circumference terminals that are adjacent in a lamination direction are in contact with each other, the inner circumference terminals that are adjacent in the lamination direction are in contact with each other, and the connection portions

that are adjacent in the lamination direction are not in contact with each other.

11. (Currently Amended) The commutator according to claim 10, ~~characterized in that~~ wherein:

each of the plurality of outer circumference terminals has a hooking portion, projecting from the corresponding one of the outer circumference terminals in a radial direction, for hooking a winding wire.

12. (Currently Amended) The commutator according to ~~any one of~~ claim[[s]] 9 and 10, ~~characterized in that~~ wherein:

the plurality of segments form a substantially cylindrical shape, and the commutator main body is formed at an inner side of the plurality of segments and has an accommodation portion for accommodating the short-circuiting member.

13. (Currently Amended) The commutator according to claim 12, ~~characterized in that~~ wherein:

the short-circuiting member is arranged in the commutator main body in a manner that the short-circuiting member does not project from the commutator main body in an axial direction.

14. (Currently Amended) The commutator according to claim 12 ~~or 13~~, ~~characterized in that~~ wherein:

the commutator main body has a main body insulator having a through-hole through which a rotary shaft is inserted at the inner side of the plurality of segments;
and

the plurality of inner circumference terminals are

arranged outward from the through-hole.

15. (Currently Amended) The commutator according to claim 14, ~~characterized in that~~ wherein:

the main body insulator includes an annular portion formed between the plurality of inner circumference terminals and the through-hole.

16. (Currently Amended) The commutator according to ~~any one of~~ claim[[s]] 12 ~~to 15~~, ~~characterized in that~~ wherein:

the short-circuiting member is arranged in the commutator main body without projecting from the commutator main body in a radial direction.

17. (Currently Amended) The commutator according to ~~any one of~~ claim[[s]] 12 ~~to 16~~, ~~characterized in that~~ wherein:

the plurality of segments each have a recess formed in an end of the segment;

the plurality of outer circumference terminals each have a projection insertable in the corresponding recess; and

the short-circuiting member is arranged at an end of the commutator main body in a state in which the projections of the outer circumference terminals are inserted in the recesses of the segments.

18. (Currently Amended) The commutator according to ~~any one of~~ claim[[s]] 12 ~~to 15~~, ~~characterized in that~~ wherein:

the plurality of segments each have a recess formed in an end of the segment and include a pair of arms;

the plurality of outer circumference terminals includes a hooking portion, projecting through the

corresponding recess, for hooking a winding wire; and
each hooking portion is fixed by bending together the
pair of arms of the corresponding recess.

19. (Currently Amended) The commutator according to ~~any one of~~
claim[[s]] 12 ~~to 18~~, ~~characterized in that~~ wherein:

the plurality of outer circumference terminals each
come in contact with an inner circumference of the
corresponding segment.

20. (Currently Amended) A method for manufacturing a short-
circuiting member ~~according to any one of claims 1 to 8~~
formed of a plurality of components each having outer and
inner circumferences, with outer and inner circumference
terminals arranged respectively along the inner and outer
circumferences, the method ~~being characterized by~~
comprising the steps of:

performing a punching process on a plurality of
conductive plate members ~~so that the~~ to form a plurality of
connection portions ~~are~~ spaced from one another in a
circumferential direction and shaping-stage connection
portions ~~are formed~~ for connecting either one of the
plurality of outer circumference terminals and the inner
circumference terminals;

laminating the plurality of ~~punched-out~~ conductive
plate members after the step of performing a punching
process so that the connection portions of one of the
plurality of components are reversed to the connection
portions of another one of the plurality of components; and

removing the shaping-stage connection portions from
the plurality of laminated conductive plate members.

21. (Currently Amended) The manufacturing method according to claim 20, ~~being characterized by~~ further comprising the step of:

filling and curing an insulator for maintaining an interval between the connection portions ~~during the period~~ between the step of laminating ~~step~~ and the step of removing ~~step~~.

22. (Currently Amended) The manufacturing method according to claim 21, ~~characterized in that~~ wherein:

the ~~insulator~~ the step of filling step and curing an insulator includes ~~a step of~~ arranging in a mold an interval maintaining member for maintaining the interval between the connection portions that are adjacent in a lamination direction.

23. (Currently Amended) The manufacturing method according to ~~any one of claim[[s]] 20 to 22, characterized in that~~ wherein the step of performing a punching step process includes:

forming a plurality of connection portions that are oriented in a first direction by performing the punching process on a first conductive plate member; and

forming a plurality of connection portions that are oriented in a second direction that is reverse to the first direction by performing the punching process on a second conductive plate member.

CLAIMS:

1. A short-circuiting member comprising:

a plurality of components, each having an outer circumference and an inner circumference, and each of the plurality of components including:

5 a plurality of outer circumference terminals arranged along the outer circumference;

a plurality of inner circumference terminals arranged along the inner circumference; and

10 a plurality of connection portions, each connecting a corresponding one of the outer circumference terminals and a corresponding one of the inner circumference terminals with the connection portions separated from each other by a predetermined angle in a circumferential direction, wherein:

15 the plurality of outer circumference terminals, the plurality of inner circumference terminals, and the plurality of connection portions are substantially formed along the same plane;

20 the plurality of components are laminated in a state in which the connection portions of one of the plurality of components are reversed to the connection portions of another one of the plurality of components; and

25 the outer circumference terminals that are adjacent in a lamination direction are in contact with each other, the inner circumference terminals that are adjacent in the lamination direction are in contact with each other, and the connection portions that are adjacent in the lamination direction are not
30 in contact with each other.

2. The short-circuiting member according to claim 1, wherein the adjacent connection portions are bent or curved so as to be spaced from each other.

3. The short-circuiting member according to claim 1, wherein each of the plurality of connection portions is thinner than the outer circumference terminals and the inner circumference terminals, the short-circuiting member further including:

an insulator arranged between the adjacent connection portions.

4. The short-circuiting member according to claim 3, further comprising:

an interval maintaining member for maintaining an interval between the adjacent connection portions.

5. The short-circuiting member according to claim 4, wherein: the insulator includes a positioning portion for positioning the plurality of components in the circumferential direction.

6. The short-circuiting member according to claim 1, wherein: each of the plurality of connection portions is formed along an involute curve.

7. The short-circuiting member according to claim 1, wherein:
at least either one of the plurality of outer
circumference terminals and the plurality of inner
circumference terminals include fitting recesses and fitting
5 projections that are formed alternately in the
circumferential direction.

8. The short-circuiting member according to claim 7, wherein:
the fitting recesses and the fitting projections are
formed in a substantially middle part of the plurality of
outer circumference terminals or the plurality of inner
5 circumference terminals.

9. A commutator comprising:
the short-circuiting member according to claim 1; and
a plurality of segments connected to the plurality of
outer circumference terminals or the plurality of inner
5 circumference terminals.

10. A commutator comprising:

a commutator main body having a plurality of segments arranged along a circumference;

a short-circuiting member including a plurality of components, each having an outer circumference and an inner circumference, and each of the plurality of components including:

a plurality of outer circumference terminals arranged along the outer circumference;

a plurality of inner circumference terminals arranged along the inner circumference; and

a plurality of connection portions, each connecting a corresponding one of the outer circumference terminals and a corresponding one of the inner circumference terminals with the connection portions separated from each other by a predetermined angle in a circumferential direction, wherein:

the plurality of outer circumference terminals, the plurality of inner circumference terminals, and the plurality of connection portions are substantially formed along the same plane;

the plurality of components are laminated in a state in which the connection portions of one of the plurality of components are reversed to the connection portions of another one of the plurality of components; and

the outer circumference terminals that are adjacent in a lamination direction are in contact with each other, the inner circumference terminals that are adjacent in the lamination direction are in contact with each other, and the connection portions that are adjacent in the lamination direction are not in contact with each other.

11. The commutator according to claim 10, wherein:

each of the plurality of outer circumference terminals has a hooking portion, projecting from the corresponding one of the outer circumference terminals in a radial direction, for hooking a winding wire.

12. The commutator according to claim 9, wherein:

the plurality of segments form a substantially cylindrical shape, and the commutator main body is formed at an inner side of the plurality of segments and has an accommodation portion for accommodating the short-circuiting member.

13. The commutator according to claim 12, wherein:

the short-circuiting member is arranged in the commutator main body in a manner that the short-circuiting member does not project from the commutator main body in an axial direction.

14. The commutator according to claim 12, wherein:

the commutator main body has a main body insulator having a through-hole through which a rotary shaft is inserted at the inner side of the plurality of segments; and the plurality of inner circumference terminals are arranged outward from the through-hole.

15. The commutator according to claim 14, wherein:

the main body insulator includes an annular portion formed between the plurality of inner circumference terminals and the through-hole.

16. The commutator according to claim 12, wherein:

the short-circuiting member is arranged in the commutator main body without projecting from the commutator main body in a radial direction.

17. The commutator according to claim 12, wherein:

the plurality of segments each have a recess formed in an end of the segment;

the plurality of outer circumference terminals each have a projection insertable in the corresponding recess; and

the short-circuiting member is arranged at an end of the commutator main body in a state in which the projections of the outer circumference terminals are inserted in the recesses of the segments.

18. The commutator according to claim 12, wherein:

the plurality of segments each have a recess formed in an end of the segment and include a pair of arms;

the plurality of outer circumference terminals includes a hooking portion, projecting through the corresponding recess, for hooking a winding wire; and

each hooking portion is fixed by bending together the pair of arms of the corresponding recess.

19. The commutator according to claim 12, wherein:

the plurality of outer circumference terminals each come in contact with an inner circumference of the corresponding segment.

20. A method for manufacturing a short-circuiting member formed of a plurality of components each having outer and inner circumferences, with outer and inner circumference terminals arranged respectively along the inner and outer
5 circumferences, the method comprising the steps of:

performing a punching process on a plurality of conductive plate members to form a plurality of connection portions ~~are~~ spaced from one another in a circumferential direction and shaping-stage connection portions for
10 connecting either one of the plurality of outer circumference terminals and the inner circumference terminals;

laminating the plurality of conductive plate members after the step of performing a punching process so that the
15 connection portions of one of the plurality of components are reversed to the connection portions of another one of the plurality of components; and

removing the shaping-stage connection portions from the plurality of laminated conductive plate members.

20 21. The manufacturing method according to claim 20, further comprising the step of:

filling and curing an insulator for maintaining an interval between the connection portions between the step of
5 laminating and the step of removing.

22. The manufacturing method according to claim 21, wherein:

the the step of filling and curing an insulator includes arranging in a mold an interval maintaining member for maintaining the interval between the connection portions that are adjacent in a lamination direction.

23. The manufacturing method according to claim 20, wherein the step of performing a punching process includes:

forming a plurality of connection portions that are oriented in a first direction by performing the punching process on a first conductive plate member; and

forming a plurality of connection portions that are oriented in a second direction that is reverse to the first direction by performing the punching process on a second conductive plate member.